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A Cross-sectional Study on Patients' Access to Healthcare in a Developing Nation

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A Cross-sectional Study on Patients' Access to Healthcare in a Developing Nation

By
Pawan Bhandari

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Science
In
Manufacturing Engineering Technology

Minnesota State University, Mankato
Mankato, Minnesota
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A Cross-sectional Study on Patients' Access to Healthcare in a Developing Nation
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Dr. Craig Evers, Advisor

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Abstract

The objective of this research study was to gauge the current status of patients' access to health care services in a developing nation or least-developed country (as defined by the World Bank and United Nations), Nepal. Many patients are not privileged to have a hospital at a close proximity in Nepal. They are also forced to travel and wait for long hours due to their inability to pay for services offered by private healthcare institutions. A survey questionnaire was developed to get a snapshot of how long patients travel to get to a public hospital for an outpatient service. The survey tool was also designed to summarize patient wait times and other factors related to patients' access to healthcare services at the site chosen for the case study. Survey results showed that patients certainly have access to the healthcare services in Nepal but it is not readily available. Patients travel and wait for hours before they get seen by the physician. Findings of this research study suggested that implementation of some process improvement interventions may result in lesser patient wait times and may help increase patient satisfaction levels which may ultimately contribute to increased health status of the overall population in Nepal.

Keywords: Patients' access, patient wait times, public hospital, outpatient service, Nepal

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Chapter 1: Introduction

1.1.Problem Statement

The term *access* is defined as the right or opportunity to use or benefit from something (Oxford Dictionaries, 2015). Hence, patients' access to healthcare implies as the right or opportunity of the patient to use or benefit from the healthcare needs from the health care provider, institution or the government in general. Nepal is a developing nation with an unstable political turmoil over the past few decades. It is officially known as the Federal Democratic Republic of Nepal; the newly elected assembly voted declaring the end of a 240 years long monarchy. Many literature articles show that Healthcare in countries has advanced over the years with advancement in technology and services provided to the patients in a timely fashion. Patients have a choice on which doctor or healthcare provider to choose to fulfil their health needs. In contrast to that, in developing countries like Nepal, many factors including socioeconomic status of the country contribute to having less or no access to healthcare for the citizens of the country.

Nepal is a country where hundreds of mothers die every year due to complications with the child birth (World Health Organization, 2015). The country does not require its citizens to purchase a health insurance plan which may be proven to be beneficial in certain cases but it causes many patients to lose their life due to inability to pay the cost of their healthcare. The country also does not provide free health services to its people. Traffic Directorate, Nepal Police, indicated that in the year 2012 – 2013 alone, 9,170 people in Nepal died due to accidents which may have been reduced by increasing access to healthcare to the patients who are the sufferers of those accidents (Thapa, 2013).

Even high-income countries have shortages of health workers in remote and rural areas. In the United States of America (USA), 9% of registered physicians practice in rural areas where 20% of the population lives (World Health Organization, 2010).

“As a low-income country (World Bank, 2009) with a population that is more than 80% rural (Central Bureau of Statistics, 2007), Nepal faces significant health care challenges. The difficulty of providing basic public health and primary care to an often remote and impoverished population in a rugged landscape is compounded by a lack of trained health workers, including physicians. Nepal's physician shortage is particularly pronounced in rural areas, where it is estimated that the physician ratio is 2.4 physicians per 100,000 people (Butterworth et al. 2008), about 100 times lower than is considered the minimum acceptable ratio by the World Health Organization (WHO, 2006) (Huntington, Shrestha, Reich, & Hagopian, 2011, p. 418, para. 1).”

1.2.Objectives

The main goal of this research study is to overview the current state scenario, open up discussion on current status of patients' access to healthcare and to recommend to the government & healthcare provider how we can increase patients' access to health care in Nepal. This is a small attempt in the process of starting up an important discussion in healthcare reforms in the developing country of Nepal.

Maharajgunj Medical Campus (MC) at Maharajgunj, Kathmandu is one of the nine campuses of the Institute of Medicine (IoM) in Nepal which is government owned and funded. IoM offers a large number of academic courses in different disciplines of health sciences (Maharajgunj Medical Campus, 2015). MC is a well-established and well known teaching hospital, which is also known as Tribhuvan University Teaching Hospital (TUTH) which was chosen as a case

study site for the research study. It serves a total of approximately 400,000 patients out of which 355,677 patients (89% of the total patients) a year are served in an outpatient setting alone (Tribhuvan University, 2015a).

Outpatient Department (OPD) at (MC) was chosen as the survey site for our research study. The case study was used as the means of reference to determine the outlined deliverables which are listed below:

- Summarize the current state gaps in Patients' Access to Healthcare in Nepal: This objective will seek to cover the status quo of how patients get into the hospital, duration of their waiting to get to the schedule and to see the doctor and the overall opportunities that lie around their going in and coming out of the clinic in an outpatient setting.
- Determine key metrics to measure the magnitude of the gaps and their relationship: This objective will look to define the key metrics on how we can measure the magnitude of gaps around patients' access to healthcare in a developing country like Nepal.
- Investigate the factors contributing to the gaps: Through structured survey, brainstorming and informal interviews, the factors contributing to the identified opportunities will be delineated.
- Brainstorm gaps, possible causes and solutions: The gaps or the opportunities, possible causes and solutions will be brainstormed. This will also be carried out through external sources, literature, best practices, discussing with subject matter experts etc. to determine the appropriate solutions to the identified gaps.

- Recommend improvement strategies / interventions: A recommendation will be made to the hospital administration and government (Ministry of Health) related to healthcare reforms, as well as to the general public to create awareness and discussion around the proposed improvements.

1.3. Research Questions

Based on the deliverables set for this research study, literature and best practice reviews, following research questions were put forward:

- *Are patients getting access to healthcare in Nepal just-in-time? If not, how long are they waiting to get to the hospital?*
- *How long are patients waiting to get to the schedule?*
- *How long are the patients waiting to be seen by the doctor after getting on schedule?*
- *What are the key contributing gaps for long patient wait times to see a provider?*
- *What are some proposed solutions?*

1.4. Scope and Limitations of the Study

In scope: Outpatient visits which occur in the Tribhuvan University Teaching Hospital, Maharajgunj Campus, are within the scope of this research study.

Out of scope: Inpatient admissions and visits, ED visits, and extended stays are not within the scope of this research work which happens at the Tribhuvan University Teaching Hospital, Maharajgunj Campus.

1.5. Methods and Procedures

- a. Develop a Questionnaire:

A questionnaire was developed which mainly consisted of questions to gather three types of information: Patient Demographics, Patient Wait Times and Patient Satisfaction. Apart from these 3 main areas of focus, there were 2 questions asked for their input or recommendations to the hospital administration if they had any.

b. Determine the reliability of the Survey Instrument:

Item Analysis with Cronbach's Alpha was carried out to test how well the set of questions measures one characteristic (or construct) and to identify questions that are problematic.

"Item Analysis helps to evaluate the correlation of related survey items with only a few statistics. Most important is Cronbach's alpha, a single number that tells about how well a set of items measures a single characteristic. This statistic is an overall item correlation where the values range between 0 and 1. Values above 0.7 are often considered to be acceptable (Griffith, 2015, pp.0-1, para. 9)."

For the survey instrument designed for this research study, Cronbach's Alpha was calculated to be .142 which shows that the survey instrument was not reliable. The value of Cronbach's alpha suggests that fine-tuning was desirable for the survey instrument designed although no fine tuning was done due to the study being a cross-sectional and qualitative research study. This will be a good starting point for future researcher who may want to take this work to next level.

c. Determine the sample size:

Whether we are in engineering, business or healthcare setting, the decisions we make should be based on fact and fact comes from the data. In most cases, 100% of the inspection is not possible or is possible but is not practical and is expensive. This is the reason we use sampling

methods to manage the risks associated with the decisions we make from the limited data available to us (Matthews, 2010).

The following formula was used to calculate the sample size for the research study.

$$n = (cl/ci)^2 (\vartheta)(1-\vartheta)$$

Where,

n (number) = the number of completed interviews or what we call the final sample size

cl (Confidence level) = the standard deviation associated with a specific area under a normal curve and corresponding to the desired confidence level (by definition, 95% confidence level = 1.96)

ci (Confidence interval) = the margin of error expressed as a decimal ($\pm 5\%$ error would be expressed as 0.05)

ϑ (Variance) = the variance or distribution of a variable in a population, expressed as a percentage in decimal form. For our purposes, variance always will be 0.5.

Hence, the final sample size for a survey with a margin of error of $\pm 5\%$ at a 95% confidence level:

$$(n) = (1.96/0.05)^2 (0.5)(0.5)$$

$$(n) = 385$$

It was determined that the minimum number of survey those will be expected to be collected for the research study will be at least 384 or more than that (Austin & Pinkleton, 2015).

d. Conduct the Survey:

Research study survey was conducted on the premises of Tribhuvan University Teaching Hospital (TUTH) at Maharajgunj, Kathmandu, Nepal. Survey was given to the patients who were waiting on the line to be scheduled for the outpatient visit. The survey was distributed randomly to the patients for 5 consecutive days and the survey response was awaited to be collected in person or by mail. The copies of the consent form, cover letter and questionnaire were given to the patients or the family members of the patients in person during the period of survey.

e. Gather the data:

The response from the survey was gathered through in person submissions or submissions through mail. Most of the submissions were made in person just-in-time. The data was then entered manually and saved on an electronic file format.

f. Analyze the data and make conclusions:

The data which was collected through the survey was later analyzed and evaluated using statistical software package SPSS (Statistical Package for the Social Sciences) and Microsoft Excel. This is an important step of the entire research study which helped the researcher to precisely make conclusions based on the findings. Based on the findings from the analysis of the data and with validation through statistical evidence, recommendations were proposed.

1.6.Organization of the study

This research study was broken down into 5 main chapters consisting of the following key sub-components.

Chapter 1: Introduction

It consists of Problem Statement, Objectives, Research Questions, Scope and Limitations of the Study, Methods and Procedure, and Organization of the Study.

Chapter 2: Literature Review

It consists of Evolution of Quality in Healthcare, Quality of Healthcare in Developed versus Developing Countries, Patients' Access to Healthcare in Developed Countries, and General synopsis of Healthcare in a developing country, Nepal.

Chapter 3: Methodology

It consists of Introduction, Research Hypotheses, Research Framework, Questionnaire Construction, Data Collection, and Discussion.

Chapter 4: Survey Results and Analysis

It consists of Introduction, Profile of Respondents, and Descriptive Statistics

Chapter 5: Summary and Conclusions

It consists of Introduction, Brief Summary, Conclusion, Research Limitations and Recommendations for Future Research.

Chapter 2: Literature Review

2.1. Evolution of Quality in Healthcare

Healthcare quality can be defined in differently ways, with differing implications for healthcare patients, providers, policy makers, and other key stakeholders. The National Academies' Institute of Medicine provides the most widely accepted definition of healthcare quality as the amount to which health services for individuals or populations increase the possibility of desired health outcomes and are consistent with the current professional acquaintance (Buchbinder & Shanks, 2007).

“The growing demand for healthcare data can be traced back to the early 1980s when a variety of external groups began pushing for the development of healthcare report cards (Lloyd, 2004a, pp. 127, para. 1).”

There is no doubt that the healthcare industry is under tremendous pressure to demonstrate that it can transform itself. We have responded extremely well in many arenas like the dramatic technological advancement in medicine. The industry has also been very creative in providing a variety of outpatient clinical and support services (e.g., home care services for patients with special needs, various nursing programs, and mobile clinics). However, healthcare has not been equally as responsive in two key areas: (1) listening and responding to the Voice of the Customer (VOC), which for us would be the voice of the patients and (2) making quality measurement practices part of daily work life (Lloyd, 2004b).

Although the evolution of healthcare quality dates back centuries, a few historians start their accounts of quality with Florence Nightingale, the founder of modern professional nursing. Ahead of her time, she used death rates to improve hospital care in the late nineteenth century

and encountered medical staff resistance. In Nightingale's early professional clash, she appealed for and received government support to continue her assessment and improvement activities. Many historians also start their chronicles with Ernest Avery Codman in the early twentieth century, perhaps because of his current popularity. As a result of today's trend toward outcomes measurement and management, he has become well known and regarded as an early exponent of emphasizing what he called the "end result" of medical care. Patients were recalled a year after discharge to evaluate treatment benefits and side effects. Today the contemporary period in healthcare corresponds with the application of TQM (Total Quality Management) and CQI (Continuous Quality Improvement) to healthcare. According to Ellis and Whittington, health care quality assurance had been proceeding along its own tradition with little reference to the development of industrial ideas and techniques. Problems with traditional quality assurance, however, led to experimentation with the industrial approach of TQM/CQI. This method, a management strategy, is described as an endless effort by all members of an organization to meet the requirements and potentials of the customer (Graham, 1995). A name that is often forgotten is Ignaz Semmelweis who is also known as pioneer of antiseptic procedures. He was also known as savior of the Mothers because of his invention, infection rate dropped down significantly. The death rate in his hospital reduced from 12.24% to 2.38% after washing hands before surgery was introduced (Margerison, 2011).

2.2. Quality of Healthcare in developed versus developing countries

People in the U.S. have the hardest time affording the health care they need. The U.S. ranks last on every measure of cost-related access. More than one-third (37%) of U.S. adults reported forgoing a recommended test, treatment, or follow-up care because of cost. Meanwhile, on

Health Care Quality, the U.S. ranks in the middle. On two of four measures of quality—effective care and patient-centered care—the U.S. ranks near the top (3rd and 4th of 11 countries, respectively), but it does not perform as well providing safe or coordinated care. United Kingdom ranks number one in most of the measures which includes Quality Care, Access, Efficiency, and Equity. Overall, US Health System ranks last among eleven countries on Measures of Access, Equity, Quality, Efficiency, and Healthy Lives (Mahon & Fox, 2014).

For 2014 survey on overall health care, The Commonwealth Fund ranked the developed countries as follows:

1. United Kingdom
2. Switzerland
3. Sweden
4. Australia
5. Germany & Netherlands (tied)
7. New Zealand & Norway (tied)
9. France
10. Canada
11. United States

(Davis, Stremikis, Squires, & Schoen, 2014)

The failure of the implementation of the comprehensive primary health care concept in most developing countries has been frequently discussed and has many reasons. Equity and solidarity call for accessibility to health care services for all groups of the society. However, in many developing countries, poverty groups have no access to modern health care services due to

financial constraints and/or insurmountable distances from their place of living to the provider. The insufficient medical care for social groups might have two reasons: low willingness to pay or low ability to pay. The income of most poor people in developing countries is so low, that they cannot afford basic health care services necessary to fight even life threatening diseases and restore their ability to work as the basis of the household wealth, even if they would like to do so. Effectiveness /quality, participation, affordability and sustainability are conflicting goals. For example, affordability calls for low fees for health care services. Consequently, the income of a health care institution is low so that they cannot afford to maintain the existing structures. The result is a poor structural sustainability (Fleba, 2009).

2.3. Patients' Access to Healthcare in Developed Countries

Access is a multifaceted concept and at least a few other aspects require evaluation. If services are available, there is an adequate supply of services. The opportunity to obtain health care exists, and a population may have access to services. The breadth to which a population gains access also depends on financial, organizational, social and cultural barriers that limit the utilization of services. Thus access measured in terms of utilization is dependent on patients' ability to pay, physical accessibility, acceptability of services and not simply availability of supply. Services available must be relevant and effective, if the population is to increase access to reasonable health outcomes (Gulliford, 2002).

Below are the key reasons on why access to health services is important:

- Gaining entry into the health care system
- Retrieving a health care location where needed facilities are provided

- Right of entry to health care influences
- Sighting a health care provider with whom the patient can interconnect and trust
- Physical, social, economic and mental health status
- Prevention of illness and disability
- Exposure and treatment of health conditions
- Importance of life
- Unavoidable death
- Life expectancy

If there are inequalities in access to health services, it affects individuals and the society.

Limited or no access to health care impacts people's ability to reach their full potential, negatively affecting their quality of life. The barriers like lack of availability, high cost and lack of insurance coverage could lead to:

- Abortive health needs
- Interruptions in receiving proper care
- Premature death
- Costly healthcare services
- Incapability to get protective services
- Hospitalizations that could have been barred

(Healthy people.gov, 2015)

In a developed country like the United States of America, many Americans have good access to health care that enables them to benefit fully from the Nation's healthcare system. Others face

barriers that make it difficult to obtain basic health care services. As shown by extensive research and confirmed in previous National Healthcare Disparities Reports (NHDRs), racial and ethnic minorities and people of low socioeconomic status (SES) are disproportionately represented among those with access problems (U.S. Department of Health and Human Services, 2014).

2.4. General Synopsis of Healthcare in a developing country, Nepal

Nepal is a country with a total population of approximately 27.8 Million. It is a land locked country with China as a neighboring country in the North, and India as a neighboring country in the East, West and South. Nepal has a Gross national income per capita of \$2 per annum. Nepal's total expenditure on health per capita is \$135. Nepal has 6.0% of the total expenditure on health as percentage of GDP (World Health Organization, 2015). Life expectancy in Nepal is 68. The percentage of population below the international poverty line of US \$1.25 per day is 24.8 (United Nations Children's Fund, 2013).

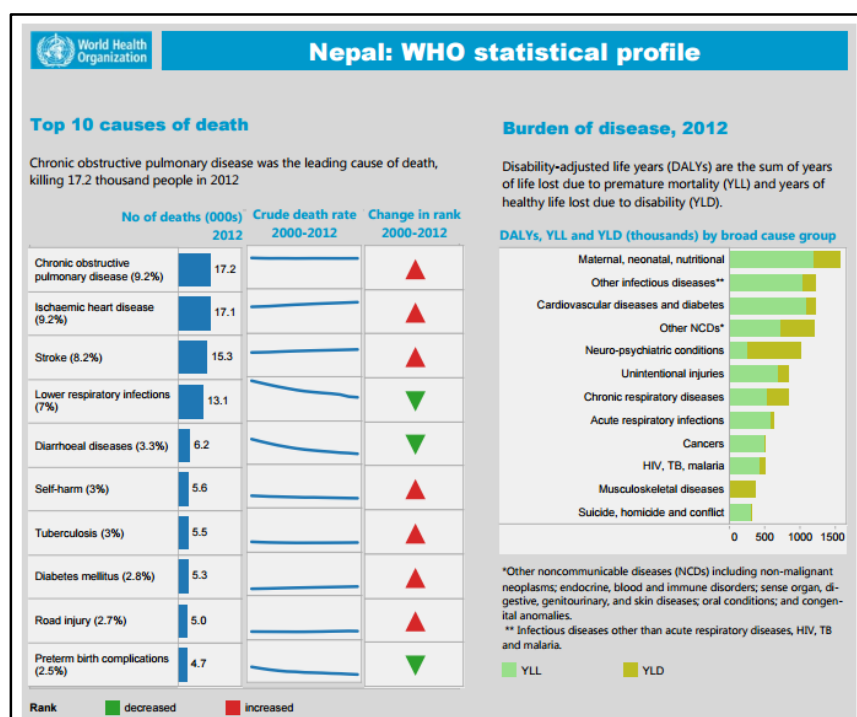


Figure. 1. World Health Organization (WHO) Country Profile

(World Health Organization, 2015)

Looking at the brighter side, Nepal has achieved remarkable progress over the last few years. The country managed to halve the percentage of people living on less than \$1.25 a day in only seven years, from 53 percent in 2003-04 to 25 percent in 2010-11 and is continuing to make progress. Several social indicators in education, health and gender have also improved.

Meanwhile, with the end of the civil war in 2006, Nepal has successfully transitioned from its post-conflict status. And while the country's political transition – notably the drafting of a new constitution – took longer than expected, the November 2013 elections resulted in a peaceful transfer in power and marked an important step toward the formation of an inclusive and democratic state. Despite Nepal's short experience of democratic government, there have been significant political achievements in the last ten years. Nepal's highly-diverse population has peacefully come to terms with difficult issues such as federalism and form of government, and forged a strong consensus about the country's identity as a secular, inclusive, and democratic republic (The World Bank, 2015).

The Interim Constitution of Nepal guarantees every citizen the fundamental right to basic health services free of cost from the State. Likewise women's right to reproductive health and other reproductive rights have also been included in part 3 of the Constitution along with children's right to basic health services. Health services are a key component of development. The rapid rate of urbanization, inadequate infrastructure and services, increase in slum and squatter settlements and a decline in the quality of the environment have created many problems in recent times. High mortality and morbidity rates among women and children, acute

preventable childhood diseases, complications of child birth, nutritional disorders and endemic diseases such as malaria, tuberculosis, leprosy, STDs, rabies, and vector borne diseases are the major problems regarding health in Nepal. Poverty, low literacy rates, poor mass education, rough topography and difficult communications, low levels of hygiene and sanitary facilities, and limited availability of safe drinking water are contributing factors to this. These problems are further worsened by under-utilization of resources, shortages of adequately trained personnel, underdeveloped infrastructure, poor public sector management and weak intra- and inter-sectoral co-ordination (Nepal Constitution Foundation, 2015).

The private sector has grown quickly in the last fourteen years, leading to many more Hospitals. Prior to 1991, there were only two private hospitals in Nepal, but growth proceeded quickly following liberalization; from 1995 to 2008, private hospitals grew from composing 23 percent of total hospitals to 78 percent.

Sector	1995(Beds)	2008 (Beds)	2008 (Beds)
Public Hospitals	78	96	6,944
Private	69 (Overall)	147 (Private Hospitals) 15 (Teaching Hospitals)	4,810 (Private Hospitals) 7,500 (Teaching Hospitals)

Table 1. Private and public hospitals in Nepal

The number of beds at private hospitals is nearly double that of public hospitals. A huge number of beds are located in private medical colleges, which have about 40 percent of total beds, illustrating the dominant role of the private sector in the delivery of curative health

services. Private hospital beds, however, are unevenly distributed across the development regions. Three quarters of hospital beds are located in the Central region where access is relatively good, compared to 13 percent in the Western region, 8 percent in the Eastern region, only 3 percent in the Mid-western region, and virtually no private hospitals in the Far Western region. Private hospitals are motivated by profit, so they are mostly located in wealthy and urban areas. The public sector served about 83 percent of all patients while the private sector serviced 17 percent (Ministry of Health and Population Government of Nepal, 2010).

Chapter 3: Methodology

3.1. Introduction

The idea behind this research study was to scan the current status of patients' access to healthcare in Nepal as mentioned in previous chapters. The foundation of the research study is based on the literature review and a few articles published on the topic under review. The researcher seeks to obtain a descriptive profile of patients who use the outpatient service at a government funded and public teaching hospital in Nepal. The popular method within the domain of the descriptive research is the cross-sectional study and also, cross-sectional studies account for the majority of formal research projects involving primary-data collection. By definition, a cross-sectional study involves data collection at only one period of time however it can also be used to obtain data pertaining to different periods in time meaning the scope of the data collected is not necessarily limited to the time at which a cross-sectional study is conducted (Parasuraman, Grewal, & Krishnan, 2006).

Furthermore, the methodology section consists of a brief description of research hypotheses, research framework, questionnaire construction, data collection, and discussion.

3.2. Research Hypotheses

Below are the null hypotheses that were proposed based on the patient wait times at various stages of the patients' journey for the outpatient setting which is also known as "Not Paying" or "Not Urgent" in TUTH, Nepal. Patient journey is a metric that has been adopted by a number of health care organizations and is used to focus and improve the processes around patient care. This concept involves analyzing the process of entering, experiencing and exiting the healthcare system (Richardson, 2007).

Proposed Null Hypotheses:

(H₀)₁: Average Home to Hospital Duration (\bar{x}_1) \leq 60 minutes

(H₀)₂: Average Hospital to Clerk Window Wait Time (\bar{x}_2) \leq 60 minutes

(H₀)₃: Average Clerk Window to Doctor's Door Wait Time (\bar{x}_3) \leq 60 minutes

(H₀)₄: Average Doctor's Door to Discharge Duration (\bar{x}_4) \leq 60 minutes

(H₀)₅: There is correlation between overall patient wait time (\bar{x}_5) and level of patient satisfaction

Proposed Alternative Hypotheses:

(H₁)₁: Average Home to Hospital Duration (\bar{x}_1) $>$ 60 minutes

(H₂)₂: Average Hospital to Clerk Window Wait Time (\bar{x}_2) $>$ 60 minutes

(H₃)₃: Average Clerk Window to Doctor's Door Wait Time (\bar{x}_3) $>$ 60 minutes

(H₄)₄: Average Doctor's Door to Discharge Duration (\bar{x}_4) $>$ 60 minutes

(H₅)₅: There is no positive or negative correlation between overall patient wait time (\bar{x}_5) and level of patient satisfaction

3.3. Research Framework

The research study was based on the framework designed below. The Figure 2 represents the Patient Wait Times as input variable and Patient Satisfaction as output variable. The bridge in between the input and output variables consists of the factors contributing to the gaps in a patients' perspective. It is assumed that addressing those factors contributing to the gap addresses the high patient dissatisfaction which may be caused due to increased patient wait times.

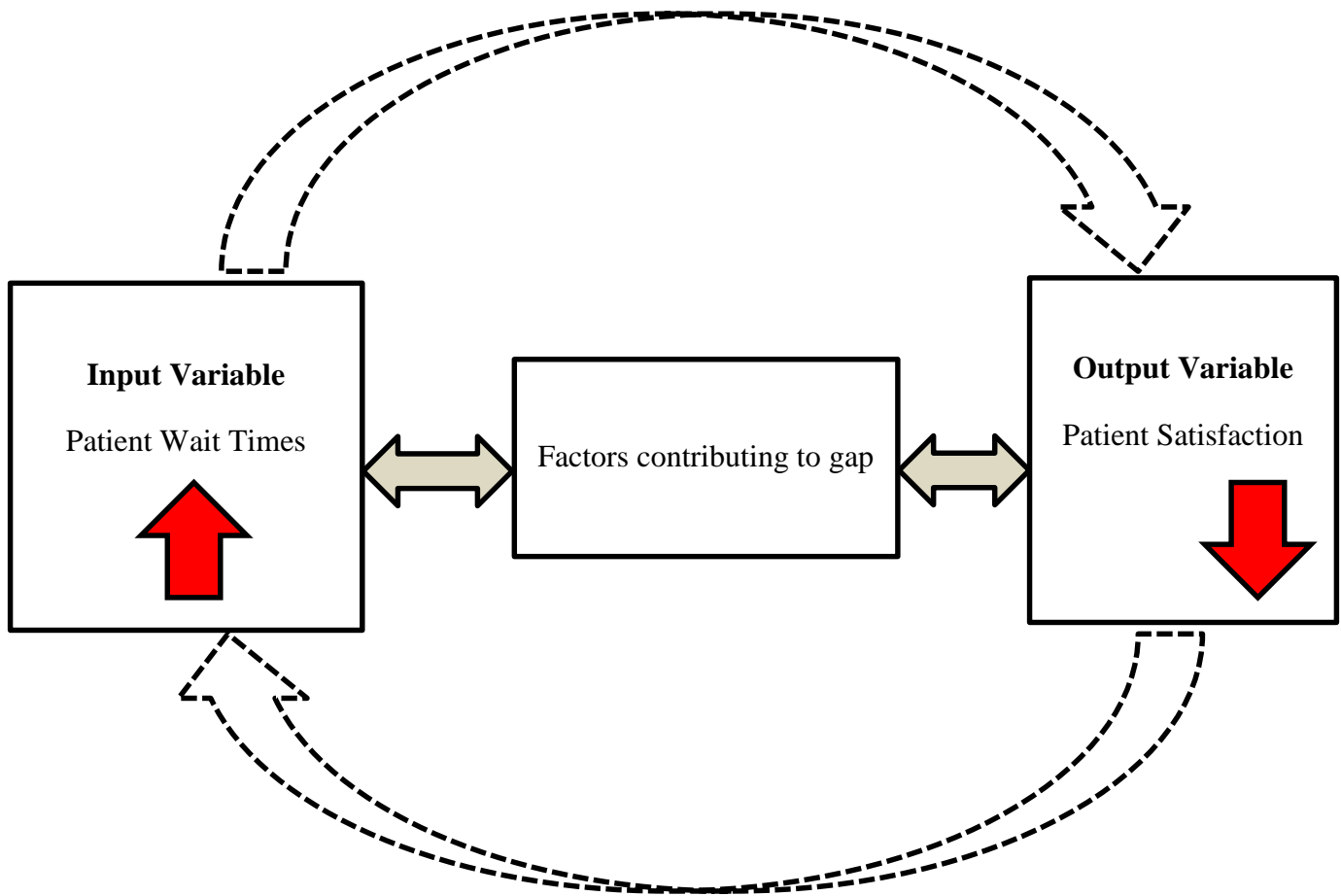


Figure 2. Research Model

3.4. Questionnaire Construction

The survey instrument was developed based around literature reviews, objectives and research hypotheses. A total of 9 questions were developed which consisted of the following sub-categories:

- i. Sex
- ii. Age
- iii. Home town
- iv. Duration between patients' home and hospital

- v. Mode of transportation
- vi. Wait time between patient being at the hospital to clerk's window
- vii. Wait time between patient being to clerk's window to doctor's door
- viii. Duration between reaching doctor's door to discharge
- ix. Overall Patients' satisfaction with the healthcare services received
- x. Ask if the patient would like to give recommendations for improvement
- xi. If patient would like to provide recommendations, capture the voice of the patients

3.5. Data Collection

The research survey instrument was used to collect the data from all the 300+ respondents.

Below is the picture of the hospital premise where the data collection was carried out.



Figure 3: Tribhuvan University Teaching Hospital, Maharajgunj Campus

(Tribhuvan University, 2015b)

Below is the map of the country and the location of the hospital where the data collection was carried out. The location of the Medical center where the data collection was carried out is marked with a star.

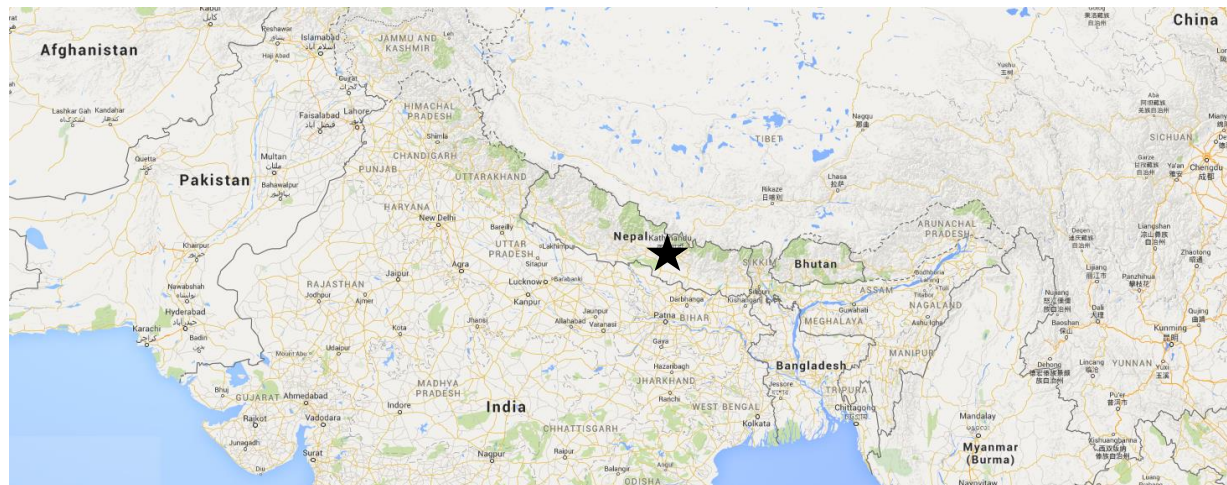


Figure 4: Map of Nepal and the location where the survey was conducted

(Google maps, 2015)

3.6. Discussion

This chapter was mainly focused on the methodology utilized for the research study as well as how did we got from the point of having no information on hand on the topic under review to having all the data and results on hand following a procedure outline in the beginning of this section. Overall learning and outcome from the methodology used for this research study was rewarding and was achieved to the full extent desired.

Chapter 4: Survey Analysis and Results

4.1.Introduction

This is the section where the fruit of the hard work is expected to flourish and the data are crunched to make it speak for itself. This section mainly covers the profile of respondents which in this case are the patients who took the survey and returned it to the researcher. This section also includes the data analysis, outcome and summary which summarizes the findings of the survey and researcher makes the conclusion based on the findings from the analysis.

4.2.Profile of Respondents

Category	Type	Number of respondents	Percentage Contribution
Sex		385	100%
	Male	203	52.70%
	Female	182	47.30%
Age		385	100%
	0 – 21	25	6.50%
	21 – 45	210	54.50%
	45- 65	109	28.30%
	65+	41	10.60%
Hometown		385	100%
	Within Kathmandu Valley	276	71.70%
	Out of Kathmandu Valley	109	28.30%
How did the patient come to the hospital?		385	100%
	Public Transportation	249	64.70%
	Private Transportation	136	35.30%

Home to Hospital Duration		385	100%
	0 – 1 Hour	128	33.20%
	1 – 3 Hours	154	40.00%
	3 – 10 Hours	53	13.80%
	10 Hours +	50	13.00%
Hospital to Clerk Waiting		385	100%
	0 – 1 Hour	150	39.00%
	1 – 3 Hours	223	57.90%
	3 – 10 Hours	12	3.10%
	10 Hours +	0	0.00%
Clerk to Doctor Waiting		385	100%
	0 – 1 Hour	145	37.70%
	1 – 3 Hours	224	58.20%
	3 – 10 Hours	15	3.90%
	10 Hours +	1	0.30%
Doctor to Discharge Duration		385	100%
	0 – 1 Hour	172	44.70%
	1 – 3 Hours	201	52.20%
	3 – 10 Hours	12	3.10%
	10 Hours +	0	0.00%
Overall Patient Satisfaction		385	100%
	Very dissatisfied	32	8.30%
	Dissatisfied	130	33.80%
	Neutral	163	42.30%
	Satisfied	56	14.50%

	Very Satisfied	4	1.00%
Did patient provide any recommendation?		385	100%
	Yes	90	23.40%
	No	295	76.60%

Table 2: Profile of respondents

4.3.Descriptive Statistics

Value Stream	Patient Wait Times/ Duration	Mean (Expected)	Mean (Actual)
A	Home to Hospital Duration	60 min or less	469.82 mins
B	Hospital to Clerk Duration	60 min or less	127.48 mins
C	Clerk to Doctor Duration	60 min or less	149.06 mins
D	Doctor to Discharge Duration	60 min or less	125.77 mins

Table 3: Expected and actual patient wait times/ duration

Mean of three different patient wait time scenarios were analyzed using the Statistical Package for Social Sciences (SPSS) Software by carrying out the 1-Sample t Test for the Mean of Home to Hospital Duration, Hospital to Clerk Waiting, Clerk to Doctor Waiting and Doctor to Discharge Duration comparing the actual means with the expected means. Based on the SPSS Statistical Software results, the following conclusions were made on the previously proposed null hypotheses.

The sample means for all four scenarios were significantly different from 60 minutes. The result is shown in table below and explanation of the result is also provided.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Home_to_Hospital_Duration	385	469.8182	871.97227	44.43982

Hospital_to_Clerk_Waiting	385	127.4805	444.29560	22.64340
Clerk_to_Doctor_Waiting	385	149.0649	495.13798	25.23457
Doctor_to_Discharge_Duration	385	125.7662	444.61125	22.65949

One-Sample Test

	Test Value = 60					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Home_to_Hospital_Duration	9.222	384	.000	409.81818	322.4423	497.1940
Hospital_to_Clerk_Waiting	2.980	384	.003	67.48052	22.9599	112.0011
Clerk_to_Doctor_Waiting	3.529	384	.000	89.06494	39.4497	138.6802
Doctor_to_Discharge_Duration	2.902	384	.004	65.76623	21.2140	110.3184

Table 4. One-sample t test result

The sample mean of Home to Hospital Duration was 469.82 ($SD = 871.97$) which was significantly different from 60, $t(384) = 9.22$, $p = .000$. The 95% confidence interval for the mean ranged from 322.44 to 497.19. The effect size d of 409.82 indicates a high effect. The sample mean of Hospital to Clerk Waiting was 127.48 ($SD = 444.30$) which was significantly different from 60, $t(384) = 2.98$, $p = .003$. The 95% confidence interval for the mean ranged from 22.96 to 112.00. The effect size d of 22.96 indicates a moderately high effect. The sample mean of Clerk to Doctor Waiting was 149.06 ($SD = 495.14$) which was significantly different from 60, $t(384) = 3.53$, $p = .000$. The 95% confidence interval for the mean ranged from 39.45 to 138.68. The effect size d of 89.06 indicates a moderately high effect. The sample mean of Doctor to Discharge Duration was 125.77 ($SD = 444.61$) which was significantly different from 60, $t(384) = 2.90$, $p = .004$. The 95% confidence interval for the mean ranged from 21.21 to 110.32. The effect size d of 65.77 indicates a moderately high effect.

In all 4 scenarios it is evident that patients are waiting a lot more than 60 minutes or less thus we reject null hypothesis of duration and wait time of 60 minutes or less in each value stream.

4.4.Overall Patient Satisfaction

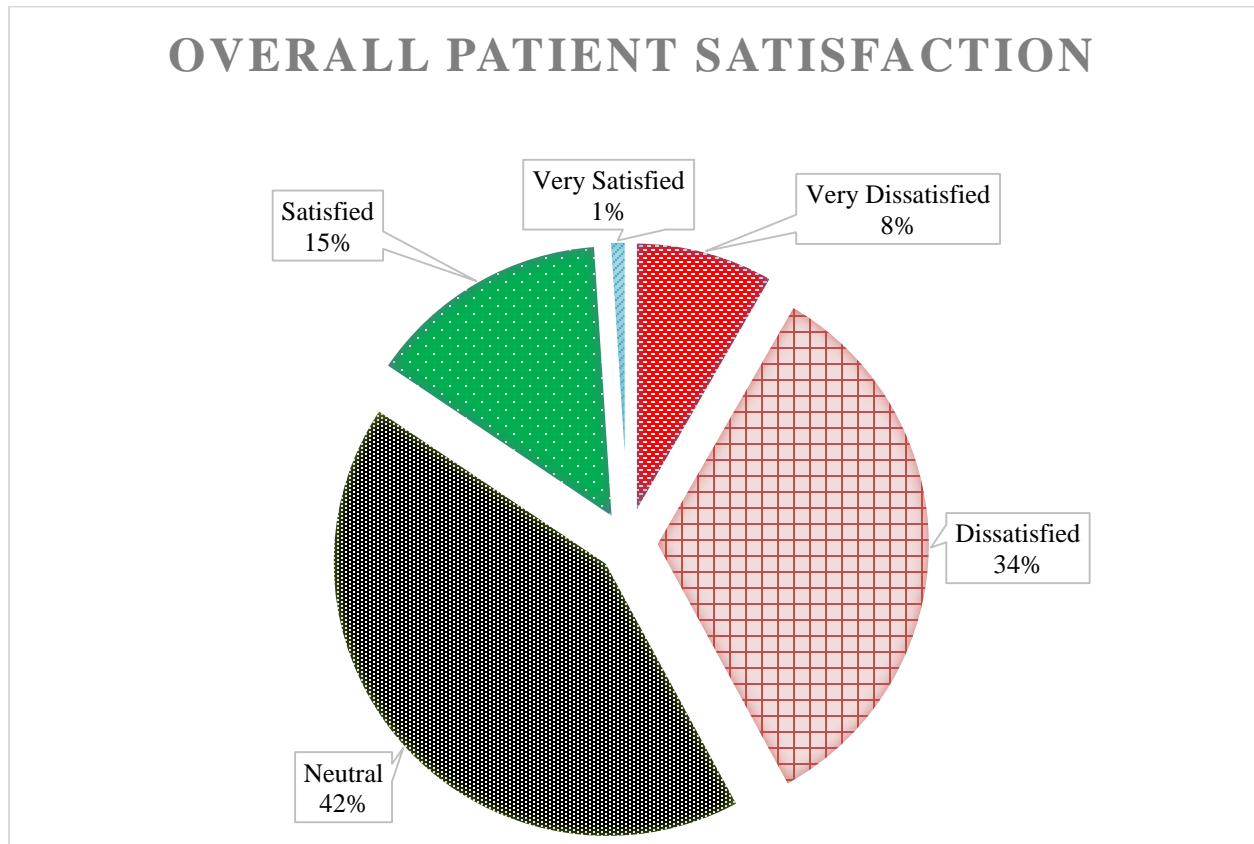


Figure 5: Breakdown of overall patient satisfaction

On a scale of 1 through 5, 1 being Very Dissatisfied and 5 being Very Satisfied, patients were asked to give a score to represent their overall satisfaction level with the service they received. Out of 385 patients, 42% patients chose to be neutral which shows that they either do not care about the satisfaction level with the service they received or they do not believe that the survey conducted on the patient satisfaction will do any good for them or for future patients. 34% of the patients were not satisfied & 8% of the patients were extremely dissatisfied with the

level of service they received. Only 15% of the patients were satisfied and 1% of the patients were extremely satisfied.

4.5. Relationship between Total Patient Wait Times and Overall Patient Satisfaction

A simple linear regression analysis was conducted to predict Patient Satisfaction (dependent variable) based on Home to Hospital Duration (X_1), Hospital to Clerk Waiting (X_2), Clerk to Doctor Waiting (X_3), and Doctor to Discharge Duration (X_4) (independent variables). A non-significant regression equation was found ($F(4,380) = 2.34$, $p > 0.05$), with an R^2 of 0.024. Patients' predicted Patient Satisfaction Level is equal to $0.54 - 2.78X_1 - 1.15X_2 + 1.58X_3 + 6.01X_4$ when Patient Satisfaction Level is measured as Percentage (20% = Very Dissatisfied, 40% = Dissatisfied, 60% = Neutral, 80% = Satisfied, 100% = Very Satisfied).

4.6. Factors contributing to the gaps and possible interventions

Below are the gaps and possible causes for the areas of opportunities discussed throughout this research study. There is a list of possible interventions that could be utilized to ensure that patients have the healthcare services within their reach without waiting too long to get to them.

Gaps	Possible Causes	Brainstormed Solutions
Long duration between Home to the Hospital	<input type="checkbox"/> No abundance of public, affordable and trust-worthy hospital nearer to patients' home <input type="checkbox"/> Poor ambulance service for emergency cases so people end up using public or private	<input type="checkbox"/> Affordable, and regulated public and private hospitals <input type="checkbox"/> Government healthcare programs for low income families <input type="checkbox"/> Government program and plan to ensure that proper patient carriers are in place like land and air

	<p>transportation</p> <ul style="list-style-type: none"> <input type="checkbox"/> Geographical Challenges 	<p>ambulance.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Developed and efficient transport system
<p>Long wait times between Hospital to Clerk Window</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Lack of proper patient scheduling system <input type="checkbox"/> Imbalance in patient volume versus staff and providers 	<ul style="list-style-type: none"> <input type="checkbox"/> Implement efficient patient appointment scheduling system – online or through phone (call center concept) free of charge. <input type="checkbox"/> Based on the historical patient volumes by days, have staffing model designed to meet patient demands
<p>Long wait times between Clerk Window (getting into the schedule) to Doctor's Door (getting seen by a physician)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Same day scheduling for outpatient visits <input type="checkbox"/> Schedule driven by the availability of Physician 	<ul style="list-style-type: none"> <input type="checkbox"/> Categorize visits by Urgent Care (Same Day Care) and visit by appointment so that patient does not have to juggle through the lines between every phase of visit. <input type="checkbox"/> Availability of online scheduling or scheduling through phone. <input type="checkbox"/> Scheduling always needs to be designed to address customer (in this case patient) demands

Paying (Separate line) versus less paying visits	<input type="checkbox"/> Patients whose source of income is less and cannot afford to go to 'paying' window	<input type="checkbox"/> Instead of giving different levels of care for rich and poor, implement a model that equally serves all levels of patients. Have quality driven service and treat all patients in the same way.
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Table 5: Gaps, possible causes and solutions

4.7.Recommended Interventions

Below is the summary of recommendations derived from above table and recommended interventions that could help improve patients' access to the hospital's healthcare services, in this case, in an outpatient setting.

Hospital Administration:

- Implement call center or online patient scheduling system.
- Implement a process improvement project to analyze the patient wait times on a bigger scale and invest in streamlining the process which will provide benefits in the long run.
- Establish a feedback mechanism from patients where they can rate the hospital, services they receive, provider, timeliness, etc. This will help to determine concerns are, and leadership can work on identifying appropriate solutions to the opportunities.

Government of Nepal and Regulatory Bodies:

- Introduce concept of Primary Care Physician (PCP) and educate population on how they can improve their lives with less hassle with one designated family physician.

- Establish a private entity like The Joint Commission (TJC) in the USA whose mission is to continuously improve health care for the public, in collaboration with other stakeholders, by evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value.
- Encourage and reward hospitals based on the quality of care (including lower patient wait times) they provide to the patients. Introduce a penalty system to the hospitals with lower patient outcomes and longer patient wait times.

Chapter 5: Summary and Conclusions

5.1. Introduction

In this final section of the research study is presented a brief summary, conclusion, research limitations and recommendations for Future Research is presented.

5.2. Brief Summary

There were not much research work done in the health care setting at the academic institutions in Nepal. As mentioned in earlier section, this research study was intended to open doors to everyone to start thinking about how can we improve patients' access to healthcare in developing countries like Nepal. Even today, thousands of mothers and infants lose their lives due to the absence of skilled health professionals during child birth in countries like Nepal and Bangladesh (Organization for Economic Co-operation and Development, 2014).

Given that health posts may be more than two days' walk away from a village, are often closed, unequipped or unstaffed, not many people bother to visit them. The first choice of treatment is Nepal's estimated 440,000 traditional healers (Harper, 2014)

Doctors do not want to go to the remote regions of Nepal because of the lack of infrastructure, social benefits and absence of technology in those areas. Government allocates the resources to the remote regions but they hardly get implemented because of the lack of reinforcement and legal and regulatory check and balance. This research effort was an eye opener to the researcher which showed that even today, many people die due to their inability to get to the hospital. Those who are able to make their trip to the hospital, they have to wait for hours to be seen by a physician.

5.3. Conclusion

The general finding of the research study suggested that patients are waiting for hours to be seen by a physician. There is no system of assigning a Primary Care Physician (PCP) to patients who visit a clinic in an outpatient setting. Patients are not happy with the level of care they receive and the waiting they are going through in general. All patients are asking is to have a hospital nearby to where they live which gives them the same or better level of care as TUTH, Maharajgunj Campus. Almost 30% of the total patients who responded the survey were there for a visit from a different district than Kathmandu which is at least 60 miles or more far from where the TUTH, Maharajgunj Campus is. Patients do not have better access to healthcare in Nepal and thus patients do not trust the level of care they receive in their neighboring hospitals. Most of the patients could not even afford the cost that the private hospitals charge and these hospitals may be near by the patients' residency. Lack of regulatory requirements and proper protocols on healthcare institutions is also contributing to the doubts that the patients are having to the private and even government regulated hospitals in the country.

5.4. Research Limitations

All the examinations and conclusions made above are based on the cross-sectional study results and are from the outcome of the survey conducted on the TUTH premises, Maharajgunj Campus, Nepal. This is a sample representation of the overall patients but may not include the voice of all the patients who makes the outpatient visit to this specific Teaching Hospital. All the assumptions may not apply to the hospitals which are being run in the various parts of the country. It is not the intention of the researcher to compare a health service provider in a

developing country with the health service provider in a developed country and show the former one a poor performer.

5.5. Recommendations for Future Research

There are a lot of opportunities with the healthcare quality in not only developing countries but also in the developed countries. This research was done externally to see how long patients wait to see a doctor in an outpatient setting in a Medical Center in developing nation like Nepal. There are opportunities to see how other components, including patients' access, work inside the healthcare facility. A lot of white papers and research work has been done in healthcare quality in developed countries but developing countries lack or have less representation of the research work in academic world. Part of that could be due to the lack of funding and resources but all the non-profit organizations working to improve the healthcare of patients in developed countries like Nepal need to invest their time, effort and resources in healthcare quality also. The Health Ministry of Nepal must also open up opportunities to the researchers and scientists by giving funds and resources to carry out the research work in healthcare sector.

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Appendix

IRB APPROVAL LETTER



January 11, 2016

Dear Craig Evers, Ph.D.:

Re: IRB Proposal entitled "[825717-5] A Cross-sectional Study on Patient's Access to Healthcare in a Developing Nation"
Review Level: Level [I]

Your IRB Proposal has been approved as of January 11, 2016. On behalf of the Minnesota State University, Mankato IRB, we wish you success with your study. Remember that you must seek approval for any changes in your study, its design, funding source, consent process, or any part of the study that may affect participants in the study. Should any of the participants in your study suffer a research-related injury or other harmful outcome, you are required to report them to the Associate Vice-President of Research and Dean of Graduate Studies immediately.

The approval of your study is for one calendar year less a day from the approval date. When you complete your data collection or should you discontinue your study, you must submit a Closure request (see <http://grad.mnsu.edu/irb/continuation.html>). All documents related to this research must be stored for a minimum of three years following the date on your Closure request. Please include your IRBNet ID number with any correspondence with the IRB.

The Principal Investigator (PI) is responsible for maintaining signed consent forms in a secure location at MSU for 3 years following the submission of a Closure request. If the PI leaves MSU before the end of the 3-year timeline, he/she is responsible for following "Consent Form Maintenance" procedures posted online (see <http://grad.mnsu.edu/irb/storingconsentforms.pdf>).

Sincerely,

A handwritten signature in black ink, appearing to read "M Hadley".

Mary Hadley, Ph.D.
IRB Coordinator

A handwritten signature in black ink, appearing to read "Sarah Sifers".

Sarah Sifers, Ph.D. LP
IRB Co-Chair

CONSENT TO PARTICIPATE IN THE RESEARCH STUDY (English)

Dear Respondent:

You are receiving this survey as part of the research work being done by me, Pawan Bhandari, a graduate student at Minnesota State University, Mankato, MN, Zip Code 56001, USA. You are being asked to take part in a research study of patients' access to healthcare in a developing nation, Nepal. We are asking you to take part in this research study but your participation is completely voluntarily. Please read this form carefully and ask any questions you may have before agreeing to take part in the study.

What the study is about: The purpose of this study is to learn how long patients wait to get access to healthcare in an outpatient/clinic setting at a government run teaching institution in Nepal. You must be a patient visiting outpatient clinic at the Maharajgunj Teaching Hospital to take part in this study.

What we will ask you to do: If you agree to be part of this study, we will ask you to complete the survey questionnaire and return it to the surveyor (me) in person or by mail to G.P.O. Box 10827, Kathmandu, Nepal. The questionnaire includes questions on your sex, age, your home town, your mode of transportation, total time you had to wait between your departure and arrival at the outpatient clinic, your level of satisfaction and your recommendations for improvement if any. The survey should take 30 minutes or less.

Risks and benefits: I do anticipate minimal risks to you participating in this study those encountered in day-to-day life.

There are no direct benefits to you for your participation on this research.

Compensation: Your participation is voluntary and you will not be compensated for your participation on this survey.

Your answers will be confidential: The records of this research study will be kept private. In any sort of report we make to the public, we will not include any information that will make it possible to identify you. Research records will be kept in a locked file at a locked office in a locked file cabinet. Only the researchers will have access to the records.

These records will be kept for 3 years beyond the end of the study and will be destroyed.

Taking part is voluntary: Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. If you decide not to take part or to skip some of the questions, it will not affect you in any ways. If you decide to take part, you are free to withdraw at any time. You can also withdraw after I have their survey with me and I have returned to USA

Participant Initial:

by emailing me to pawan.bhandari@mnsu.edu. The survey can be withdrawn until one day before the final presentation is done for the Thesis Committee. The day for final presentation has not been finalized yet but will be before May, 2016.

If you have questions: The researchers conducting this study are Craig Evers, Ph.D. (Principal Investigator) and Pawan Bhandari (Student Researcher). Please ask any questions you have now. If you have questions later, you may contact Craig Evers, Ph.D, at craig.evers@mnsu.edu or at 00-1-507-389-5023. You can reach Pawan Bhandari at pawan.bhandari@mnsu.edu or 00-1-347-622-9016. If you have any questions or concerns regarding your rights as a subject in this study, you may contact Barry Ries, IRB Administrator, Institutional Review Board (IRB), Minnesota State University, Mankato, at 00-1-507-389-5102 or irb@mnsu.edu or access their website at <http://grad.mnsu.edu/irb/>

You may also report your concerns or complaints anonymously by contacting Institutional Review Board at Minnesota State University, Mankato.

You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

Your Signature _____ Date _____

Your Name (printed)_____

Signature of person obtaining consent _____ Date _____

Printed name of person obtaining consent _____ Date _____

IRBNet Number: 825717

Participant Initial:

CONSENT TO PARTICIPATE IN THE RESEARCH STUDY (Nepali)

अमेरिकाको मिनेसोटा स्टेट युनिभर्सिटीमा स्नातकोत्तर अध्ययन गर्दै गरेका सोधार्थी श्री पवन भण्डारीले सोधको क्रममा सहभागीहरुसँग लिएको

सहमति पत्र

सहभागी महोदय,

तपाईंले यो सहमति पत्र मेरो सोधको एउटा प्रकृया अन्तर्गत पाउनु भएको हो । मेरो नाम पवन भण्डारी हो र हाल म अमेरिकाको मिनेसोटा स्टेट युनिभर्सिटीमा स्नातकोत्तर अध्ययन गरिरहेको छु । तपाईंलाई मेरो यो सर्भेक्षणमा सर्भेक्षण फारम भरी भाग लिनुहुन आग्रह गरिएको छ । तपाईंलाई सर्भेक्षणमा भागलिन भनिए पनि तपाईंको सहभागीता स्वैच्छिक हुनेछ । फारम भर्नु अघि यस अनुमति पत्रमा भएको व्यहोरा राम्रोसँग पढ्नुहुन अनुरोध गरिन्छ ।

सोधको उद्देश्य : यो सोधको मुख्य उद्देश्य विकासोन्मुख देश नेपालको एउटा शिक्षण अस्पतालको क्लिनिकमा बिरामीहरुले उपचार गर्दा कतिबेर पर्खिनु भनी पत्ता लगाउनु हो । यो सर्भेक्षणमा भाग लिन तपाईं शिक्षण अस्पतालको ओपिडी वार्डको बिरामी भएको हुनुपर्छ ।

हाम्रो आग्रह : यदि तपाईं सहमत हुनुहुन्छ भने तपाईंलाई हामी सर्भेक्षण फारम भरेर जिपिओ बक्स काठमाडौं, नेपालमा पत्राचार गर्न भन्छौं । या तपाईंले भरेर यो सर्भेक्षण सिधै अनुसन्धान कर्ताको हातमा दिन पनि सक्नुहुन्छ । सर्भेक्षण फारम भर्न बढीमा तीन मिनेट लाग्न सक्छ ।

सर्भेक्षणको जोखिम र लाभ : यो सर्भेक्षणका परिणाम अत्यन्तै कम जोखिमपूर्ण छन् । तपाईंले यो सर्भेक्षण भरे वापत कुनै लाभ हुने छैन ।

मुआब्जा : तपाईंको सहभागिता नितान्त स्वैच्छिक हो र भागलिए वापत तपाईंलाई कुनै पारिसर्मिक दिइने छैन ।

गोप्यता : तपाईंले दिएको जवाफ गोप्य हुने छ । तपाईंले पूरा गरेका सर्भेक्षणका सबै प्रतिहरु गोप्यरूपमा राखिने छन् । अनुसन्धानका रेकर्डहरु तीन वर्षसम्म युनिभर्सिटीको गोप्य लकबक्समा सम्प्रक्षण गरी राखिने छन् । तीन वर्ष पूरा भएपछि सबै कागजातहरु नष्ट गरिने छन् ।

सर्वेक्षणमा भाग लिनु स्वैच्छिक हो : पहिले भनिएजस्तै यो अनुसन्धानमा भागलिनु स्वैच्छिक हो । तपाईं यो सर्वेक्षणबाट जुनसुकै बेला बाहिरिन सक्नुहुन्छ । मेरो थेसिस कमिटीको मौखिक प्रस्तुतिको एक दिन अगाडीसम्म तपाईं आफ्नो सहभागिताबाट बाहिरिन सक्नुहुन्छ । त्यसको लागि pawan.bhandari@mnsu.edu मा इमेल गर्न सक्नुहुने छ ।

अरु केही प्रश्न भए : यो अनुसन्धान गर्ने अनुसन्धान कर्ताहरु डा क्रेग एभर्स (मुख्य अनुसन्धान कर्ता) र पवन भण्डारी (विद्यार्थी अनुसन्धान कर्ता) हुन् । सर्भेक्षण सम्बन्धी केही प्रश्न भए अहिले सोध्न सक्नुहुन्छ । पछि तपाईंलाई अरु प्रश्नहरु सोध्न मन लागे डा क्रेग एभर्सलाई ०० १ ५०७ ३८९ ५०२३ मा र पवन भण्डारीलाई ०० १ २४७ ६२२ ९०१६ मा सम्पर्क गर्न सक्नुहुन्छ । तपाईंलाई आफ्नो अधिकारको बारेमा प्रश्नहरु भए बारी रिजलाई ०० १ ५०७ ३८९ ५१०२ मा मिनेसोटा युनिभर्सिटी मेनकेटो अथवा इमेल ठेगाना craig.evers@mnsu.edu मा पनि इमेल गर्न सक्नुहुन्छ ।

तपाईंका केही सवाल वा सुझाव भएमा आफ्नो नाम गोप्य राखेर इन्टिच्युसनल रिभ्यू बोर्ड मा मिनेसोटा स्टेट युनिभरसिटी मेनकेटोमा सोझै सम्पर्क गर्न सक्नुहुन्छ ।

तपाईंको रेकर्डको लागि यो फारमको एउटा प्रति उपलब्ध गराइन्छ ।

दस्तखतः

तपाईंको नाम :

दस्तखत र मिति :

सहमति पत्र भराउने व्यक्तिको नाम :

दस्तखत र मिति :

IRBNet Number: 825717

दस्तखतः

SURVEY QUESTIONNAIRE (English)

1. Sex
 - ☐ Male
 - ☐ Female
2. Age _____
3. What is your home town and district? _____
4. How long did it take you to come to the hospital? _____
5. How did you come to the hospital (Motor Bike, Public Bus, Private Car, Taxi, etc.)?
 - ☐ Private Transportation , list here _____
 - ☐ Public Transportation, list here _____
6. Please estimate your times below: (Time stamp to calculate the wait times)
 - ☐ You came to the hospital at _____
 - ☐ You got the admission ticket at _____
 - ☐ You got to doctor's door at _____
 - ☐ You got discharged at _____
7. How satisfied are you with the overall level of care you received here? (Circle one)
 - ☐ Very dissatisfied
 - ☐ Dissatisfied
 - ☐ Neutral
 - ☐ Satisfied
 - ☐ Very Satisfied
8. Do you want to give recommendations to the Hospital Administration?
 - ☐ Yes (Answer Question Number 9)
 - ☐ No (No need to answer Question Number 9)
9. What is/are your recommended improvement(s)?

SURVEY QUESTIONNAIRE (Nepali)

सर्भे प्रश्नोत्तर

1. लिंग
 - ☐ पुरुष
 - ☐ महिला
2. उमेर :
3. तपाईंको घर कहाँ हो ? (गाउँ र जिल्ला) :
4. तपाईं घरबाट यहाँ अस्पतालमा आउन कति समय लाग्यो ? :
5. तपाईं घरबाट यहाँ अस्पतालसम्म आउँदा कुन साधन प्रयोग गरेर आउनुभयो ? (बाइक, सार्वजनिक बस, व्यक्तिगत कार, टेक्सी वा अरु कुनै साधन) ?
 - ☐ व्यक्तिगत गाडीमा भए, यसमा :
 - ☐ सार्वजनिक गाडीमा भए, यसमा :
6. कृपया तलका मध्ये तपाईंको समय अनुमान गर्नुहोस् है (तपाईंले यहाँ पर्खदा लागेको समय)
 - ☐ तपाईं अस्पताल आइपुगेको समय :
 - ☐ तपाईंले भर्ना टिकट लिएको समय :
 - ☐ तपाईं डाक्टरको ढोकासम्म आइपुगेको समय :
 - ☐ तपाईंले डाक्टरसँग जाँचाएर बाहिर निस्किएको समय :
7. यहाँको उपचारबाट कतिको सन्तुष्ट हुनुभयो ? तलका मध्ये एउटामा चिनो लगाउनु पर्दा कुनमा लगाउनुहुन्छ ?
 - ☐ पटकै सन्तुष्ट भइन
 - ☐ सन्तुष्ट भइन
 - ☐ सामान्य
 - ☐ सन्तुष्ट भएँ
 - ☐ एकदम सन्तुष्ट भएँ
8. तपाईंको उपचार बारे के तपाईं अस्पताललाई कुनै सुझाव दिन चाहनुहुन्छ ?
 - ☐ अवश्य (दिने भए ९ मा लेख्ने) :
 - ☐ त्यस्तो कुनै सुझाव छैन । (त्यसो भए केही लेख्नु परेन)
9. अस्पताल सुधारको लागि तपाईं कुनै सुझाव दिन चाहनुहुन्छ ?

RECRUITING SCRIPT

I am Pawan Bhandari, Citizen of Nepal and I am currently doing my Masters of Science in Manufacturing Engineering Technology at Minnesota State University, Mankato, Minnesota, USA. As a part of my Graduate Degree program, I am required to do a Thesis. This research study is being done as a partial fulfilment of my degree requirement. The purpose of this study is to learn how long patients wait to get access to healthcare in a clinic setting at a government run teaching institution in Nepal. I am asking patients leaving the hospital to complete a brief survey about their wait times at various intervals of appointment. Would you be interested in helping me by completing my survey?

The researchers conducting this study are Craig Evers, Ph.D. (Principal Investigator) and Pawan Bhandari (Student Researcher). Please ask any questions you have now. If you have questions later, you may contact Craig Evers, Ph.D, at craig.evers@mnsu.edu or at 00-1- 507-389-5023. You can reach Pawan Bhandari at pawan.bhandari@mnsu.edu or 00-1-347-622-9016. If you have any questions or concerns regarding your rights as a subject in this study, you may contact Barry Ries, IRB Administrator, College of Graduate Studies & Research, Minnesota State University, Mankato, at 00-1-507-389-2321 or email at barry.ries@mnsu.edu .

REGRESSION ANALYSIS

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.154952248
R Square	0.024010199
Adjusted R Square	0.013736622
Standard Error	0.171444171
Observations	385

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	4	0.274776462	0.068694116	2.337082754	0.054932478
Residual	380	11.16937938	0.029393104		
Total	384	11.44415584			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.543886707	0.01097657 1	49.54978131	6.477E-168 0.00604187
Home_to_Hospital_Duration (Mins)	-2.78088E-05	1.0072E-05	-2.761002628	3 0.56185108
Hospital_to_Clerk_Waiting (Mins)	-1.14634E-05	1.97439E-05	-0.580604655	5 0.37373410
Clerk_to_Doctor_Waiting (Mins)	1.57735E-05	1.77121E-05	0.890550011	5 0.76120716
Doctor_to_Discharge_Duration (Mins)	6.01114E-06	1.9766E-05	0.304114438	8

<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
0.522304282	0.565469131	0.522304282	0.565469131
-4.76126E-05	-8.00498E-06	-4.76126E-05	-8.00498E-06
-5.02845E-05	2.73576E-05	-5.02845E-05	2.73576E-05
-1.90524E-05	5.05994E-05	-1.90524E-05	5.05994E-05
-3.28534E-05	4.48757E-05	-3.28534E-05	4.48757E-05

DESCRIPTIVE STATISTICS

Statistics

	Gender	Age	Hometown	Mode_of_Transportation	Home_to_Hospital_Duration
N Valid	385	385	385	385	385
Missing	0	0	0	0	0

Hospital_to_Clerk_Waiting	Clerk_to_Doctor_Waiting	Doctor_to_Discharge_Waiting	Overall_Patient_Satisfaction	Patient_Feedback
385	385	385	385	385
0	0	0	0	0

Frequency Table

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	203	52.7	52.7	52.7
Female	182	47.3	47.3	100.0
Total	385	100.0	100.0	

Age

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 - 21 years old	25	6.5	6.5	6.5
21 - 45 years old	210	54.5	54.5	61.0
45 - 65 years old	109	28.3	28.3	89.4
65 years old and above	41	10.6	10.6	100.0
Total	385	100.0	100.0	

Hometown

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Within Kathmandu Valley	276	71.7	71.7	71.7
Outside of Kathmandu Valley	109	28.3	28.3	100.0
Total	385	100.0	100.0	

Mode_of_Transportation

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Public	249	64.7	64.7	64.7
Private	136	35.3	35.3	100.0
Total	385	100.0	100.0	

Home_to_Hospital_Duration

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 - 1 hour	128	33.2	33.2	33.2
1 - 3 hours	154	40.0	40.0	73.2
3 - 10 hours	53	13.8	13.8	87.0
10 hours and above	50	13.0	13.0	100.0
Total	385	100.0	100.0	

Hospital_to_Clerk_Waiting

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 - 1 hour	150	39.0	39.0	39.0
1 - 3 hours	223	57.9	57.9	96.9
3 - 10 hours	12	3.1	3.1	100.0
Total	385	100.0	100.0	

Clerk_to_Doctor_Waiting

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 - 1 hour	145	37.7	37.7	37.7
1 - 3 hours	224	58.2	58.2	95.8
3 - 10 hours	15	3.9	3.9	99.7
10 hours and above	1	.3	.3	100.0
Total	385	100.0	100.0	

Doctor_to_Discharge_Waiting

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 - 1 hour	172	44.7	44.7	44.7

1 - 3 hours	201	52.2	52.2	96.9
3 - 10 hours	12	3.1	3.1	100.0
Total	385	100.0	100.0	

Overall_Patient_Satisfaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	32	8.3	8.3	8.3
	Dissatisfied	130	33.8	33.8	42.1
	Neutral	163	42.3	42.3	84.4
	Satisfied	56	14.5	14.5	99.0
	Very Satisfied	4	1.0	1.0	100.0
	Total	385	100.0	100.0	

Patient_Feedback

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	90	23.4	23.4	23.4
	No	295	76.6	76.6	100.0
	Total	385	100.0	100.0	